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COMMENT ON WESTERGAARD'S "SCOPE AND METHOD OF STATISTICS."

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The reading of Westergaard's article on "Scope and Method of Statistics" makes me hope for the early translation of the manuscript and publication in English of his work on statistical theory. Particularly, I would like to have access to Westergaard's treatment of the probable error in time and geographic series, his discussion of the Pearsonian coefficient of correlation and his use of elementary methods of analysing data.

The present article leaves one doubtful concerning several points. For instance, at the end of Part I Westergaard says, "Consequently, there will be in the future an *embarras de richesses*; the difficulty will be not so much in gathering material as in mastering it and perusing all these masses of reports which have been stored in the archives and on the book-shelves of the statistical offices." In the concluding paragraph of the article he says, "First of all our object must be not so much to prepare refined statistical methods as to provide useful observations . . . at present we are more in need of statistical data than of theoretical investigations." In fact, we need both. If we have at hand the calculus which will enable us to derive the meaning from data of a certain kind, such a calculus will, first, encourage us to secure the necessary data and, second, determine the form of the data to be secured.

Westergaard does not correctly describe the economic statistics available today when he refers to them as "scanty material" of "doubtful reliability." Statistics of interest rates, exchange rates, production of commodities, prices, railroad earnings, clearings and the like are neither scanty nor unreliable. It is true we need more data, well classified; we also need a generally accepted calculus for treating them.

With Westergaard's characterization of the Pearsonian coefficient of correlation I emphatically disagree: "The coefficient of correlation will tell us nothing which cannot be

seen from an inspection of the original numbers.” Recently I have been working on a problem involving the following question: Is the maximum correlation between steel production and prices and clearings obtained when concurrent items are paired or for a lag in one of the series? Such a question can be answered only by the application of a device such as the coefficient of correlation which enables us to measure the degree of correlation.

Representative investigations should, as Westergaard says, be used more frequently. Methods of interpolation and the theory of error must of necessity be developed for the treatment of the data thus secured.

My experience accords with Westergaard's that “it is possible to apply the binomial law of frequency to many fields of vital statistics,” that in economic statistics the law is more difficult to apply, but that “the typical frequency curve in all vital, social, or economic statistics is always the binomial one.” I agree that search for a formula which fits accurately a statistical series is usually unnecessary and that the securing of such a function is of use mainly, if not exclusively, for interpolating values. It is obvious that by using a sufficiently large number of constants a function may be found to “fit” with a high degree of accuracy any statistical series.

Westergaard's caution that we should “keep the original data in view” is one that every investigator should hold in mind.

The publication of Westergaard's book in English will be warmly welcomed by American statisticians.